

United States Patent [19]
Kaswan

[11] **Patent Number:** 4,839,342
[45] **Date of Patent:** * Jun. 13, 1989

[54] **METHOD OF INCREASING TEAR PRODUCTION BY TOPICAL ADMINISTRATION OF CYCLOSPORIN**

[75] Inventor: **Renee Kaswan**, Athens, Ga.

[73] Assignee: **University of Georgia Research Foundation, Inc.**, Athens, Ga.

[*] Notice: The portion of the term of this patent subsequent to Jun. 13, 2006 has been disclaimed.

[21] Appl. No.: 92,466

[22] Filed: Sep. 3, 1987

[51] Int. Cl.⁴ A61K 37/02

[52] U.S. Cl. 514/11; 514/915

[58] Field of Search 424/78; 514/11, 9, 912, 514/914, 915, 15; 530/317

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,108,985	8/1978	Ruegger et al.	.....	514/11
4,117,118	9/1978	Harri et al.	.....	514/11
4,210,581	7/1980	Ruegger et al.	.....	530/321
4,215,199	7/1980	Harri et al.	.....	435/71
4,220,641	9/1980	Traber et al.	.....	514/11
4,220,657	9/1980	Johnson et al.	.....	514/912
4,288,431	9/1981	Traber et al.	.....	514/11
4,289,851	9/1981	Traber et al.	.....	435/71
4,384,996	5/1983	Bollinger et al.	.....	530/321
4,388,307	6/1983	Cavanak	.....	514/11
4,396,542	8/1983	Wenger	.....	530/32
4,452,818	6/1984	Haidt	.....	514/912
4,554,351	11/1985	Wenger	.....	514/11
4,639,434	1/1987	Wenger et al.	.....	514/11
4,649,047	3/1987	Kaswan	.....	514/11
4,681,754	7/1987	Siegl	.....	424/10
4,703,033	10/1987	Seebach	.....	514/11

FOREIGN PATENT DOCUMENTS

19197	3/1972	Australia	.....	424/78
8404681	12/1984	PCT Int'l Appl.	.....	514/912
8501875	5/1985	PCT Int'l Appl.	.....	514/914
8603966	7/1986	PCT Int'l Appl.	.....	514/912

OTHER PUBLICATIONS

Kaswan et al., Am. J. Vet. Res. 46, 376-383 (1985). Wenger, Synthesis of Cyclosporin and Analogues, pp. 14-25 in Cyclosporin vol. 1, Grune & Stratton, Inc. (New York, 1983).

BenEzra et al., Amer. J. Ophthalmol. 101, 278-282 (1986).

Hunter et al., Clin. Exp. Immunol. 45, 173-177 (1981). Boisjoly et al., Arch. Ophthalmol. 102, 1804-1807 (1984).

Mosteller et al., Investigative Ophthalmol. Supp. 25, 3, 38 (1984).

Nussenblat et al., Amer. J. Ophthalmol. 96, 275-282 (1983).

Hoffman, et al., Kin. Mbl. Augenheilk. 187, 92-95 (1985) and certified translation thereof.

"Aspirin Therapy in Vernal Conjunctivitis" by Abelson, et al., Amer. J. Ophthal. 95, 502-505 (1983).

"Cryosurgery in the Management of Vernal Keratoconjunctivitis" by Abiose, et al., Annals of Ophthal. 15(8), 744-747 (1983).

"Vernal Conjunctivitis" by Allansmith, Chapter 9, pp. 1-8 Clinical Ophthalmology, vol 4, (Harper & Row 1986). "Cyclosporine Eyedrops for the Treatment of Severe Vernal Keratoconjunctivitis" BenEzra, et al. Amer. J. Ophthal. 101, 278-282 (1986).

"Diagnosis and Treatment of Tear Deficiencies" Lemp, Chapter 14, pp. 1-10.

Clinical Ophthalmology vol. 4, Duane and Jaeger, Ed. (Harper & Row 1986).

"Diseases of the Cornea" by Grayson at pp. 334-367 (The C.V. Mosby Co. 1983).

Primary Examiner—Delbert R. Phillips

Assistant Examiner—T. D. Wessendorf

Attorney, Agent, or Firm—Kilpatrick & Cody

[57] **ABSTRACT**

The present invention provides a method of treating an aqueous-deficient dry eye state in a patient suffering therefrom, which method includes the step of administering cyclosporin topically to the patient's eye. The cyclosporin is administered as a solution, suspension or ointment in a pharmaceutically acceptable excipient.

18 Claims, No Drawings